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MINUTES.

Stated Meeting, January 6, 1922.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

The decease was announced of

Henry Turner Eddy, Ph.D., Sc.D., LL.D., on December 11, 1921, æt. 77.

Mr. Alfred Flinn, of New York, read a paper entitled "Engineering Research and Vicarious Tests."

Stated Meeting, February 3, 1922.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

The decease was announced of

Rt. Hon. James Bryce, Viscount Bryce, O.M., LL.D., D.C.L., at Sidmouth, England, on January 22, 1922, æt. 84.

Mr. H. Goodwin, Jr., read a paper entitled "The Meaning of Superpower to the Public."

Stated Meeting, March 3, 1922.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

The decease was announced of the following:

James W. Holland, M.D., at Philadelphia, on February 10, 1922, æt. 73.

John C. Branner, Ph.D., Sc.D., LL.D., at Stanford University, on March 1, 1922, æt. 71.

Dr. Walton Brooks McDaniel read a paper on "Ancient Survivals in Modern Greece and Italy."

Stated General Meeting, April 20, 21, and 22, 1922.

Opening Session, Thursday Afternoon, April 20.

HAMPTON L. CARSON, M.A., LL.D., Vice-President, in the Chair.

Prof. Paul Shorey and Prof. E. Washburn Hopkins, recently elected members, subscribed the Laws and were admitted into the Society.

The following papers were read:

"Our Contradictory Economic Policy," by E. M. Patterson, Ph.D., Professor of Economics, University of Pennsylvania. (Introduced by Prof. Emory R. Johnson.)

"The Distribution of Human Ability in Europe," by Ellsworth Huntington, Ph.D., Research Associate in Geography, Yale University. (Introduced by Mr. Henry G. Bryant.)

"George Hammond and Robert Liston—British Ministers in Philadelphia," by J. F. Jameson, Carnegie Institution of Washington, Department of Historical Research, discussed by Mr. Carson and Dr. Hays.

"The Threefold Trinity," by E. Washburn Hopkins, Ph.D., LL.D., Professor of Sanskrit and Comparative Philology, Yale University.

"The Use of Devices for Indicating the Vowel Length in Latin," by John C. Rolfe, Ph.D., Professor of Latin Language and Literature, University of Pennsylvania.

"A Sketch of the Modern Faeroe Dialect," by J. Dyneley Prince, Ph.D., U. S. Envoy Extraordinary and Minister Plenipotentiary to Denmark.

Friday, April 22.

Executive Session, 10 O'Clock.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

Dr. Lawrence J. Henderson, a newly elected member, subscribed the Laws and was admitted into the Society.

The President delivered his Annual Address as follows:

"Under the new laws of the Society adopted last autumn, it becomes the duty of the Chair to present to the Society at this executive meeting a brief report concerning the activities of the Society for the preceding year and the state of its property and personnel.

"The total number of members of the Society on December 31 last was 476; 402 being residents of the United States and 74 foreign members. Of the American members, 121 reside within 30 miles of the hall, which is about 25 per cent. of the total membership; 281 reside beyond 30 miles of the hall, almost 60 per cent. of the membership. The foreign membership is about 15½ per cent. For some years past, by direction of the Society, no foreign members have been elected, because it was thought that the percentage of such members was already too high; and it was resolved that until the number of foreign members was reduced to 50 no further additions to the list should be made, save in case of unusual emergency. During the year 18 members died and 15 were elected.

"During the year eight stated meetings were held, and there was one special meeting for the purpose of receiving Madame Curie, who had been elected to membership in 1910. She exhibited and described one of the instruments which she and her husband had used in accurate measurement of radio-activity. At the same meeting the Board of City Trusts of Philadelphia presented to Madame Curie one of the John Scott medals and awards.

"At the annual General Meeting, in April last, 108 members were present and 54 papers were read. The Henry M. Phillips prize of $2,000 was awarded to Mr. Qunicy Wright, of Minneapolis, for his essay entitled 'The Control of the Foreign Relations of the United States.'

"The report of the Curators is to the effect that the collections of the Society, both in the building and those which are deposited elsewhere, are in good condition.

"The Treasurer's report has been printed and distributed for your information. It may be briefly summarized as follows:

"The assets in the Treasury, at par, of securities is $310,000, one half of which belongs to the general fund and the other half to special funds. The securities are in the custody of the Pennsylvania Company for Insurance on Lives and Granting Annuities, as our agent for the collection of income.

"The general income of the Society, for other than trust fund purposes, is about $13,000.

"The Building Fund, which is in the hands of the Girard Trust Company, as Trustee, amounted at the last report to $72,216. The income of this fund is added to the principal as it accrues. Since this report the Society has received a legacy from the estate of our late member, Ferdinand J. Dreer, of $3,537.46, which the Society has voted should be added to the Building Fund, bringing this up to about $75,750.

"The Publication Committee has been much hampered by the strike of the printers, which has affected nearly the whole country. Two numbers of the *Proceedings* were published in 1921, and two other numbers, completing the volume, were published early in 1922. Under the new laws, the committee has appointed Dr. Alexander C. Abbott to be the Editor of the Society's publications.

"The question of scientific publication is one of the most difficult problems which scientific men have to face at the present time. All avenues of such publication are choked with contributions which deserve publicity, but which can not have it under present conditions. Of especially distressing urgency is the question of adequate illustrations for the papers published. The extravagantly inflated prices which have been brought about by the war make such illustrations almost unattainable, and lithographic plates are only for multimillionaires. In my judgment, the Society could do nothing so serviceable to science in this country as raising a fund which should enable it to increase its publications extensively, and especially to provide suitable and proper illustrations. This service to our scientific public would be well rewarded in the increase of the Society's prestige and reputation.

"The Library Committee reports the total number of volumes in the Library at the end of 1921 to have been 69,687, of which the accessions of the year were 960 volumes. In addition to these, there are 4,069 maps. There are sent to the Library 1,833 serial publications, of which 1,255 are received in exchange for the Society's publications. The subscriptions and exchanges for all countries, with the exception of Russia and the Balkan States, have been resumed; the gaps created by the war have been largely filled up and measures are being taken to fill the gaps that still remain.

"This gives you in brief form a statement of the Society's activities and plans; and I would, in closing, particularly urge upon you the necessity of doing something to increase publication and provide illustrations. The Society has largely increased the sum to be devoted to publication in the ensuing year, but this will do nothing more than put us back where we were before the inflation of prices began, and does nothing to increase our facilities. This, I take it, is the most important problem that we have to solve."

Morning Session, 10.45 O'Clock.

The following papers were read:

"Novæ as Variable Stars," by E. E. Barnard, D.Sc., LL.D., Professor of Practical Astronomy, University of Chicago, Astronomer of Yerkes Observatory.

"The Message of a Meteorite," by Monroe B. Snyder, of the Philadelphia Observatory.

"The Effect of Diurnal Variation of Clock Rates Upon Longitude Work," by R. H. Tucker, C.E., Lick Observatory, Mt. Hamilton, California, discussed by Prof. Ernest W. Brown.

"Discussion of a Kinetic Theory of Gravitation, II.; and Some New Experiments in Gravitation. Second Paper," by Charles F. Brush, Sc.D., LL.D., Cleveland.

"Absorption Spectra and Ionization Potential in Dissociated Gases," by Karl T. Compton, Ph.D., Princeton University. (Introduced by Dr. Augustus Trowbridge.) Discussed by Profs. Goodspeed and Snyder.

"Recent Developments in Vacuum Tubes and Their Use," by J. H. Morecroft, Columbia University, New York. (Introduced by Dr. A. W. Goodspeed.)

"A Primary Standard of Light," by Herbert E. Ives, Ph.D., New York City.

"Surface Equilibrium of Certain Colloid Solutions," by P. Lecomte du Noüy, M.D., of the Rockefeller Institute. (Introduced by Dr. Carrel.) Discussed by Prof. Scott.

Afternoon Session, 2 O'Clock.

HAMPTON L. CARSON, M.A., LL.D., Vice-President, in the Chair.

Messrs. Douglas Campbell, John J. Carty, and Moses Gomberg, recently elected members, subscribed the Laws and were admitted into the Society.

The following papers were read:

"Notes on the Ecology of the Clovers (*Trifolium*)," by John W. Harshberger, A.B., Ph.D., Professor of Botany, University of Pennsylvania.

"The Cytoplasm in Development and Heredity," by E. G. Conklin, Ph.D., Sc.D., Professor of Biology, Princeton University.

"The Supposed Serial Arrangement of the Genes, and its Relation to Theories of Crossing-over in Inheritance," by H. S. Jennings, Ph.D., LL.D., Professor of Zoölogy and Director of the Zoölogical Laboratory, Johns Hopkins University.

"The Relation of the Retinal Image to Animal Reactions," by G. H. Parker, S.D., Prof. of Zoöl., Harvard Univ.

"Parallel Mutations in Œnothera," by George H. Shull, B.S., Ph.D., Professor of Biology, Princeton University.

"Some Climatic and Topographic Characters in the Rings of the Yellow Pines and Sequoias of the Southwest," by A. E. Douglass, D.Sc., Director of Steward Observatory, University of Arizona. (Introduced by Dr. D. T. MacDougal.)

"The Probable Action of Lipoidals in Growth," by D. T. MacDougal, M.A., Ph.D., LL.D., Director of the Department of Botanical Research, Carnegie Institution of Washington, Tucson, Arizona, discussed by Dr. Ernest W. Brown.

"A Possible Explanation of Eocene Climates," by Edward W. Berry, Professor of Palæontology, Johns Hopkins University.

Friday Evening.

Mr. Vernon Kellogg spoke on "The Power and Impotence of Man."

Saturday Morning, April 22.

Executive Session, 10 O'Clock.

William B. Scott, Sc.D., LL.D., President, in the Chair.

Prof. Edward Capps and Dr. T. B. Osborne, recently elected members, subscribed the Laws and were admitted into the Society.

The Society proceeded to the election of Officers and Councillors for the ensuing year and for members, and the Tellers subsequently reported the following as having been elected:

President.

William B. Scott.

Vice-Presidents.

Arthur A. Noyes,
Henry Fairfield Osborn.
Hampton L. Carson,

Secretaries.

Arthur W. Goodspeed,
Harry F. Keller,
John A. Miller.

Curators.

William P. Wilson,
Henry H. Donaldson.

Treasurer.

Eli Kirk Price.

Councillors.

(To serve for three years.)

Lafayette B. Mendel,
Herbert S. Jennings,
William W. Campbell,
Robert A. Millikan.

(To fill an unexpired term in the class of 1920.)

Felix E. Schelling.

Members.

Residents of the United States.

Charles Elmer Allen, Ph.D., Madison, Wis.
Rollins Adams Emerson, Sc.D., LL.D., Ithaca.

Worthington C. Ford, A.M., Litt.D., Cambridge, Mass.
Frederick E. Ives, Philadelphia.
Irving Langmuir, Ph.D., Schenectady, N. Y.
Roland S. Morris, A.B., LL.D., Philadelphia.
George William Norris, A.B., M.D., Philadelphia.
Charles Lee Reese, Ph.D., Wilmington, Del.
Harlow Shapley, Cambridge, Mass.
Henry Skinner, M.D., Philadelphia.
James Perrin Smith, A.M., Ph.D., LL.D., Palo Alto, Calif.
Charles Cutler Torrey, A.M., Ph.D., D.D., New Haven.
Robert De Courcy Ward, A.M., Cambridge, Mass.
Henry Stephens Washington, A.M., Ph.D., Washington.
David Locke Webster, Stanford University, Cal.

The resignation of Dr. W. M. L. Coplin was received and accepted.

Morning Session, 10.30 O'Clock.

William B. Scott, Sc.D., LL.D., President, in the Chair.

The following papers were read:

"Hyracodonts from the Big Badlands of South Dakota," "The Small Entelodonts of the White River Oligocene," by W. J. Sinclair, Ph.D., Department of Geology, Princeton, N. J. (Introduced by Prof. W. B. Scott.) Discussed by Prof. Scott.

"Lithology of the White River Sediments," by H. R. Wanless, Princeton University. (Introduced by Prof. C. H. Smyth.)

"Lava Domes and Their Composition in the Malay Archipelago," by H. A. Brouwer, M.I., Professor of Historic Geology and Paleontology, Technical High School, Delft, Netherlands; Exchange Professor at Univ. of Michigan. (Introduced by Prof. W. B. Scott.)

"Application of Biophysical Researches to Medical Problems," by George W. Crile, M.D., and Hugo Fricke, Ph.D., Cleveland.

"Experiments in Epidemiology," by Simon Flexner, M.D., D.Sc., LL.D., Director of Laboratories, Rockefeller Inst. for Medical Research.

"Fishes Used in Guayaquil for Mosquito Control Against Yellow Fever," by Carl H. Eigenmann, Ph.D., Professor of Zoölogy, Indiana University.

"The Carbonic Acid of the Blood in Health and Disease," by Lawrence J. Henderson, M.D., Asst. Professor of Biological Chemistry, Harvard Medical School.

"Some Recent Experiments Concerning the Nature of the Function of the Kidney," by A. N. Richards, M.D., University of Pennsylvania. (Introduced by Dr. H. H. Donaldson.)

"The Biblical Manna," by Paul Haupt, Ph.D., LL.D., Professor of Semitic Languages, Johns Hopkins University.

Afternoon Session, 2 O'Clock.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

Prof. Wilder D. Bancroft, a recently elected member, subscribed the Laws and was admitted into the Society.

The President announced the award of the Magellanic Premium to Paul R. Heyl and Lyman J. Briggs, of the U. S. Bureau of Standards, for the invention of "The Earth Inductor Compass," and presented to them the Magellanic Gold Medal.

Messrs. Heyl and Briggs exhibited a model of the compass and described it, and Lieutenant J. Parker Van Zandt, official representative of the U. S. Army Aviation Service, made some appreciative remarks on the invention.

The President made the following remarks on the retirement of Dr. Hays from the Secretariat after a continuous service of twenty-five years:

"The members of the Society will have noted, with feelings akin to dismay, that for the first time in many years the name of Dr. I. Minis Hays is absent from the list of Secretaries, Dr. Hays having retired in spite of the many urgent requests that he should continue in office.

"It is difficult to understand what the Society can do without Dr. Hays, for he has been its mainspring and driving force for years past. The Society was in a moribund, or at least a comatose, condition when he began his work; and Dr. Leidy about that time described it to me as an example of 'how a Society that pretended to demand some measure of distinction from those whom it elected to membership was doomed to sterility and inactivity by that very fact.' Now this has all been changed; and the annual General Meeting of this Society, which was inaugurated on Dr. Hays's suggestion, is universally regarded as of great importance. The late Professor Pickering, when Vice-President of the Society, once remarked from this chair that this annual meeting had become, in his opinion, the most important and the most interesting scientific event of the year.

"All this we owe to Dr. Hays, and it is fitting that the Society should recognize his invaluable services. I will therefore call upon the Secretary to read the Resolution which he has prepared for this occasion."

Secretary Goodspeed offered the following minute:

"Whereas we have all known for some time of the intended retirement at this time of our senior Secretary and Librarian, Dr. I. Minis Hays, and

"Whereas we are all deeply impressed with the inestimable value of his long and faithful service to our honorable Society, we, the members, hereby unite to record our deep appreciation of all Doctor Hays has done to forward the interests of the Society, and our sincere regret that he is to be no longer with us in his former official capacity, together with our earnest desire that he may yet for many years remain our willing adviser in the conduct of the affairs of the Society."

This minute was duly seconded and unanimously adopted.

The following papers were read:

"Description of Earth Inductor Compass," by Paul R. Heyl and Lyman J. Briggs. (Introduced by the President.)

"Symposium on the Age of the Earth,"

"From the Geological Viewpoint," by T. C. Chamberlin, Sc.D., LL.D., Professor of Geology and Director of the Walker Museum, University of Chicago.

"From the Palæontological Viewpoint," by John M. Clarke, Ph.D., Sc.D., LL.D., Director of the Department of Science and State Museum, Albany, N. Y.

"From the Astronomical Viewpoint," by Ernest W. Brown, M.A., Sc.D., Professor of Mathematics, Yale University.

"From the Radioactive Viewpoint," by William Duane, Professor of Biophysics, Harvard Medical School.

Special Meeting, May 5, 1922.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

Hon. Roland S. Morris and Mr. Frederick E. Ives, newly elected members, subscribed the Laws and were admitted into the Society.

Letters accepting membership were received from:

Charles Elmer Allen, Ph.D., Madison, Wis.
Rollins Adams Emerson, Sc.D., LL.D., Ithaca.
Worthington C. Ford, A.M., Litt.D., Cambridge.
Frederick E. Ives, Philadelphia.
Roland S. Morris, A.B., LL.D., Philadelphia.
George W. Norris, A.B., M.D., Philadelphia.
Charles Lee Reese, Ph.D., Wilmington.
Robert DeC. Ward, A.M., Cambridge.

Prof. C. B. Bazzoni and Mr. Raymond Morgan, of the University of Pennsylvania, read a paper upon "Wireless Telephony and the Popular Use of the Radiophone in the Diffusion and Reception of Vocal and Instrumental Sounds, with Experiments," which was discussed by Prof. Snyder.

Stated Meeting, November 3, 1922.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

The Patron, His Excellency the Governor of Pennsylvania, was present and took his seat on the platform.

Dr. Henry Skinner, a newly elected member, subscribed the Laws and was admitted into the Society.

Letters accepting membership were received from:

Irving Langmuir, Ph.D., Schenectady, N. Y.

Harlow Shapley, A.M., Ph.D., Cambridge.
Henry Skinner, M.D., Philadelphia.
James Perrin Smith, A.M., Ph.D., LL.D., Palo Alto, Calif.
Henry S. Washington, A.M., Ph.D., Washington.
David Locke Webster, A.B., Ph.D., Stanford Univ.

A letter was received from Dr. Charles C. Torrey, of New Haven, declining election.

The following letter from the Marquis Antonio de Gregorio was read:

PALERMO VIA MOLO 132.

Very Honored Sir:

I pray you to be so kind to insert in the PROCEEDINGS OF A. PHILOSOPH. SOCIETY this little paragraph on Gravitation and accept my best regards.

MARQUIS ANT. DE GREGORIO,
Cor. Member of A. Ph. Soc.

ON GRAVITATION'S KINETIC THEORY.

I have read with much interest the communication of Mr. Charles F. Brush on the Kinetic Theory of Gravitation (PROC. AMERIC. PHILOSOPH. SOC., Vol. LX., No. 2, p. 43). But I must observe that already in 1892 I proposed the same theory to the Academy of Sciences of Palerme. My work has the title "Sul Continuto della Spazio e sulla causa della gravitazione." It has been published in a volume "Nuovi Strumenti fisici e sulla piu probabile origine del nostro sistema stellare" (Palermo 1893) that has been published in the memoirs of our Academy of Sciences in Palerme. After many years, in 1914, I presented a work to the Societa Siciliano di Scienze Naturali upon the mere cosmogonic theories (Sulle nuove teorie cosmogoniche, sull' origine della materia). In this work, which has been published in the *Naturalista Siciliano* (April 1914) I have again discussed and elucidated and cleared this theory. I said that if there are two masses, they shall be pushed each toward the other by the difference of pression (tension) of ether, because the tension of ether is different in the space and in portion of it interposed between the two masses. So the two corps shall be converse each toward the other. I have considered ether as passing through the matter, but I observe that matter absorbs some part of its energy and transforms it: Radium phenomena are perhaps some of the manifestations of it. I considered matter not as a dead thing but as a living thing.

In 1921 M. Olinto De Pretto formulated a theory on gravitation that reproduced in part my theory, but he did not cite my work! He published a book "Lo spirito dell' Universo" (Turin 1921) in which he attributes gravitation to ether's action. In the review *Urania* that is published in Turin (x, n. 2, p. 75) there is a recension of it.

Gravitation is a most important natural phenomenon but hitherto unfortunately problematic. The work of Mr. Brush is valuable and commendable and his experiments are very instructive. But I think that my work is not to be neglected because it contains the priority of the theory and the foundation of the new conception of gravitation.

MARQUIS ANTONIO DE GREGORIO.

PALERMO, JULY 20, 1922.
SICILY, ITALY.

The decease was announced of the following members:

Alexander Graham Bell, LL.D., Ph.D., Sc.D., M.D., near Baddeck, N. S., on August 2, 1922, æt. 75.

Herman Diels, Ph.D., at Berlin, on June 4, 1922, æt. 74.

Merrill E. Gates, LL.D., at Littleton, N. H., on August 11, 1922, æt. 74.

Waterman T. Hewett, B.A., M.A., Ph.D., at London, England, on September 13, 1921, æt. 75.

Henry Marion Howe, A.M., LL.B., LL.D., Sc.D., at Bedford Hills, N. Y., on May 14, 1922, æt. 75.

Jacobus Cornelius Kapteyn, at Amsterdam, Holland, on June 18, 1922, æt. 72.

Alfred G. Mayer, M.E., Sc.D., in Florida, on June 25, 1922, æt. 54.

Joseph T. Rothrock, B.S., M.D., at West Chester, Pa., on June 2, 1922, æt. 83.

Coleman Sellers, Jr., M.S., at Bryn Mawr, Pa., on August 15, 1922, æt. 70.

Stephen Smith, M.D., at Elmira, N. Y., on August 26, 1922, æt. 99.

Edward Anthony Spitzka, M.D., at Mt. Vernon, N. Y., on September 6, 1922, æt. 46.

Ambrose B. Wyckoff, A.B., Lieut. U. S. N., at Ontario, California, on May 30, 1922, æt. 74.

Dr. John A. Miller read a paper on "The Rome Meeting of the International Astronomical Union," which was discussed by Prof. Snyder, Governor Sproul, President Scott, and Dr. W. W. Keen.

Stated Meeting, December 1, 1922.

WILLIAM B. SCOTT, Sc.D., LL.D., President, in the Chair.

Mr. Charles Lee Reese, a newly elected member, subscribed the Laws and was admitted into the Society.

The following communication from Mr. Charles F. Brush, in reply to the letter of the Marquis de Gregorio, was read:

Through the courtesy of the Secretaries, it has been my privilege to read the letter of the Marquis de Gregorio and to offer such remarks as seem fitting.

Gregorio contributed a number of very interesting papers on many scientific subjects under the general title "Su Taluni Nuovi Strumenti," etc., published in the *Atti della Reale Accademia,* Palermo, 1895.

Professor Borgerhoff, of Western Reserve University, has very kindly prepared for me a careful translation of all of these papers, giving special attention to the last chapter, "On the Contents of Space and the Cause of Gravitation" (pp. 177–181).

I have studied this paper very carefully, and following is my understanding of its meaning: Gregorio assumes the ether to be everywhere in a state of "tension" (very evidently using this term in the sense of pressure) normally uniform. He says bodies of matter absorb ether, somewhat as spongy platinum absorbs gases, and the absorbed ether is rendered inactive or latent, analogous to latent heat. Different kinds of matter absorb different amounts of ether, and their densities depend on the amounts of ether absorbed. The free ether outside a body exerts pressure, not on the matter composing the body, but on the condensed or latent ether within it.

Absorption of ether by a body of matter reduces the "tension" (pressure) of the ether surrounding the body in proportion to the amount of ether absorbed. Two neighboring bodies will have less ether pressure against their parts facing each other than against their parts turned away from each other, and they will be urged toward each other by the superior ether pressure on the sides turned away.

Gregorio continues: "Instead of explaining the phenomenon" (gravitation) "by means of an absorption, one might also explain it by means of a rotary molecular vibration. To this end we may suppose that ether is in a state of continual special vibration determining its tension, and that this vibration is decreased by its passage through the molecular interstices of the matter. The contrary might, however, be supposed, and this would appear more plausible, viz., that the phenomenon is caused by the vibration of the atoms composing the matter, and that the tension of the outside ether is transformed by the molecular vibration of the bodies. This seems to me the more plausible opinion."

In neither his ether-absorption theory nor his alternative hypotheses does Gregorio explain how the supposed diminution of ether pressure outside bodies of matter is maintained after absorption of ether has ceased: and indeed this seems to me impossible of explanation. Nor does he offer any suggestion of the source of the energy acquired by falling bodies.

My own "Kinetic Theory of Gravitation,"[1] put forth in December, 1910, is based on two fundamental concepts of the ether of space: First, that the ether is endowed with vast intrinsic energy—energy quite apart from matter—free energy. This was then and is now the belief of many eminent physicists. Second, that some, perhaps all, of the ether's intrinsic energy exists in wave form of some sort capable of motive action on matter, and propagated in every conceivable direction, so that the wave energy, or energy flux, is isotropic; and whereby a disturbance of any kind, anywhere in the ether, is in due time felt everywhere else, the intensity of disturbance diminishing with the inverse square of distance from its seat.

The last concept above I believe to be original with me. I find nothing of it in Gregorio's paper, but it is essential to my theory.

In his more recent paper, 1914, Gregorio reaffirms his 1892 theory of ether pressure and ether absorption by matter, and seeks to "develop my idea further" in the light of more recent discoveries in physics. He now regards the ether as a "dynamic fluid" composed of "imponderable particles, extremely minute, of the condensed fluid itself," which he calls "superatoms." He says further that "the actions of magnetic and electric currents" clearly prove "that an imponderable fluid can generate energy and, as it were, transform itself into energy." . . .

Again I find nothing of the second, and essential, postulate of my own theory.

CHARLES F. BRUSH.

CLEVELAND,
November, 1922.

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[1] *Science,* March 10, 1911; *Nature,* March 23, 1911; PROC. AMER. PHIL. SOC., Vol. LIII., No. 213, Jan.–May, 1914; PROC. AMER. PHIL. SOC., Vol. LX., No. 2, 1921.

Prof. William Duane read a paper on "The Activities of the Radium and X-Ray Plants of the Cancer Commission of Harvard University," which was discussed by Doctors Keller, Keen, Goodspeed, and Reese.

The dates of the General Meeting of 1923 were fixed for April 19, 20, and 21.